AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1-10. (cancelled)

11. (currently amended) A laser milling system comprising:

a tool path module operable to determine a tool path for ablating a layer of material from an exposed surface of a workpiece with a laser, wherein the tool path describes a continuously constant arc speed achieving a continuous spiral by application of the laser according to a continuously, non-uniformly changing radius and angular progression during the spiral;

a plurality of lasers operable to perform ablation of a plurality of workpieces according to the tool path; and

a control module operable to ablate a layer of material from an exposed surface of the workpiece with a laser according to the tool path, wherein said control module is operable to continuously modify angular velocity as a function of the continuously changing radius, thereby accomplishing the continuously constant arc speed.

12. (original) The system of claim 11, wherein said tool path module is operable to formulate a radius and a local angular speed.

13. (original) The system of claim 12, wherein said control module is operable to control the radius as a function of voltage output to a PZT scan mirror of the plurality of lasers, and wherein said tool path module is operable to determine an initial voltage.

14. (original) The system of claim 13, wherein said control module is operable to vary the radius according to a tool pitch that corresponds to a decrease in voltage per revolution, and wherein said tool path module is operable to determine a tool pitch based on a spot size of the plurality of lasers.

15. (cancelled)

16. (original) The system of claim 12, wherein said control module is operable to modify the tool path to accomplish removal of successive layers of material from a newly exposed surface of the workpiece, wherein the successive layers of material respectively decrease in area, thereby affecting a desired contour in the laser milled workpiece.

17. (original) The system of claim 16, wherein said control module is operable to modify the tool path by decreasing the radius and increasing the local angular speed.

18. (original) The system of claim 11 further comprising simultaneously performing ablation of multiple workpieces according to the tool path, wherein ablated regions of each workpiece is composed of substantially identical material and has substantially identical geometric characteristics.

19. (original) The system of claim 11 further comprising simultaneously performing ablations of multiple regions of a workpiece according to the tool path, wherein each of said multiple regions is composed of substantially identical material and has substantially identical geometric characteristics.

20-23. (cancelled)

24. (currently amended) The system of claim 14, wherein a ~~maximum~~ tool pitch is less than fifty percent of average spot size.

25. (currently amended) The system of claim 24, wherein the ~~maximum~~ tool pitch is no more than forty percent of average spot size.

26. (currently amended) The system of claim 25, wherein the ~~maximum~~ tool pitch is no more than thirty percent of average spot size.

27. (currently amended) The system of claim 26, wherein the ~~maximum~~ tool pitch is no more than twenty percent of average spot size.

28. (previously presented) The system of claim 11, wherein said control module applies an ultrafast laser at a constant rate of fire throughout the spiral.

29. (new) The system of claim 11, wherein the radius is computed during an inward spiral according to:

$$r(t) = \sqrt{r_0^2 - (\frac{r_0^2 - r_{min}^2}{T})t},$$

and the angular velocity is computed during the inward spiral according to:

$$\omega(t) = \omega_0 \frac{r_0}{r(t)}.$$

30. (new) The system of claim 11, wherein the radius is computed during an outward spiral according to:

$$r'(t) = \sqrt{2r_{min}^2 - r_0^2 + (\frac{r_0^2 - r_{min}^2}{T})t},$$

and the angular velocity is computed during the outward spiral according to:

$$\omega'(t) = \omega_0 \frac{r_0}{r'(t)}.$$